

[54] SNAP SWITCH

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[58] Field of Search ..... 200/67 A, 67 D, 67 PK, 200/76, 240, 241, 243, 284, DIG. 42

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[57] ABSTRACT

A snap switch comprises a control button, a control rod slidable with the control button via a spring, two pairs of contacts associated, respectively, with two pairs of terminals, the two contacts of each pair of contacts being connectable by resilient conducting means under the action of a setting spring fixed to the control rod and to these resilient conducting means. The two contacts of one pair of contacts are borne by two pivotable conducting plates, biased by resilient means for connecting the two contacts borne by the conducting plates to their respective terminals. The conducting plates can be pivoted under the action of the control button and against the action of the resilient biasing means for disconnecting the two contacts borne by the conducting plates from their respective terminals.

2 Claims, 3 Drawing Figures

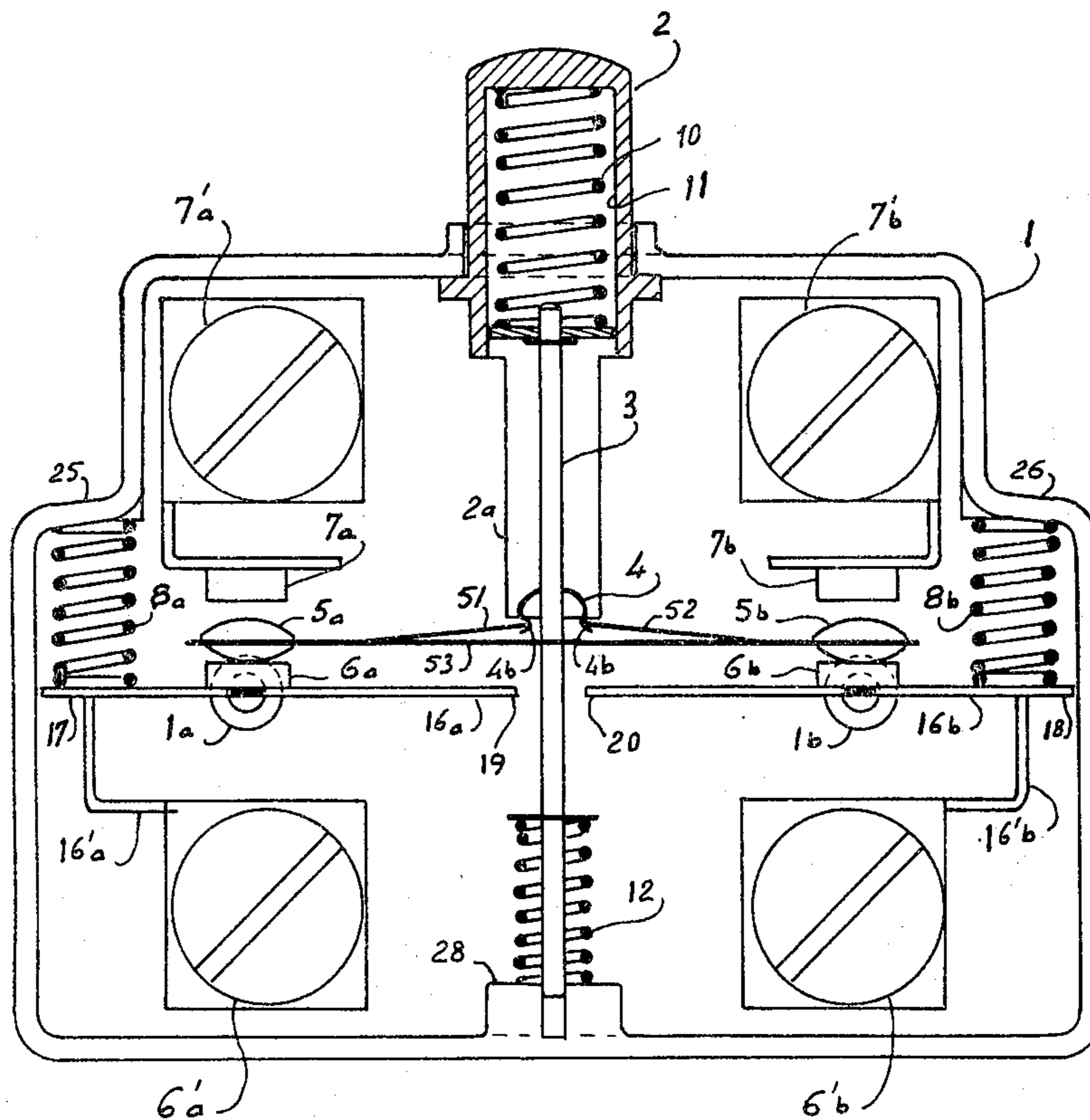


FIG. 1

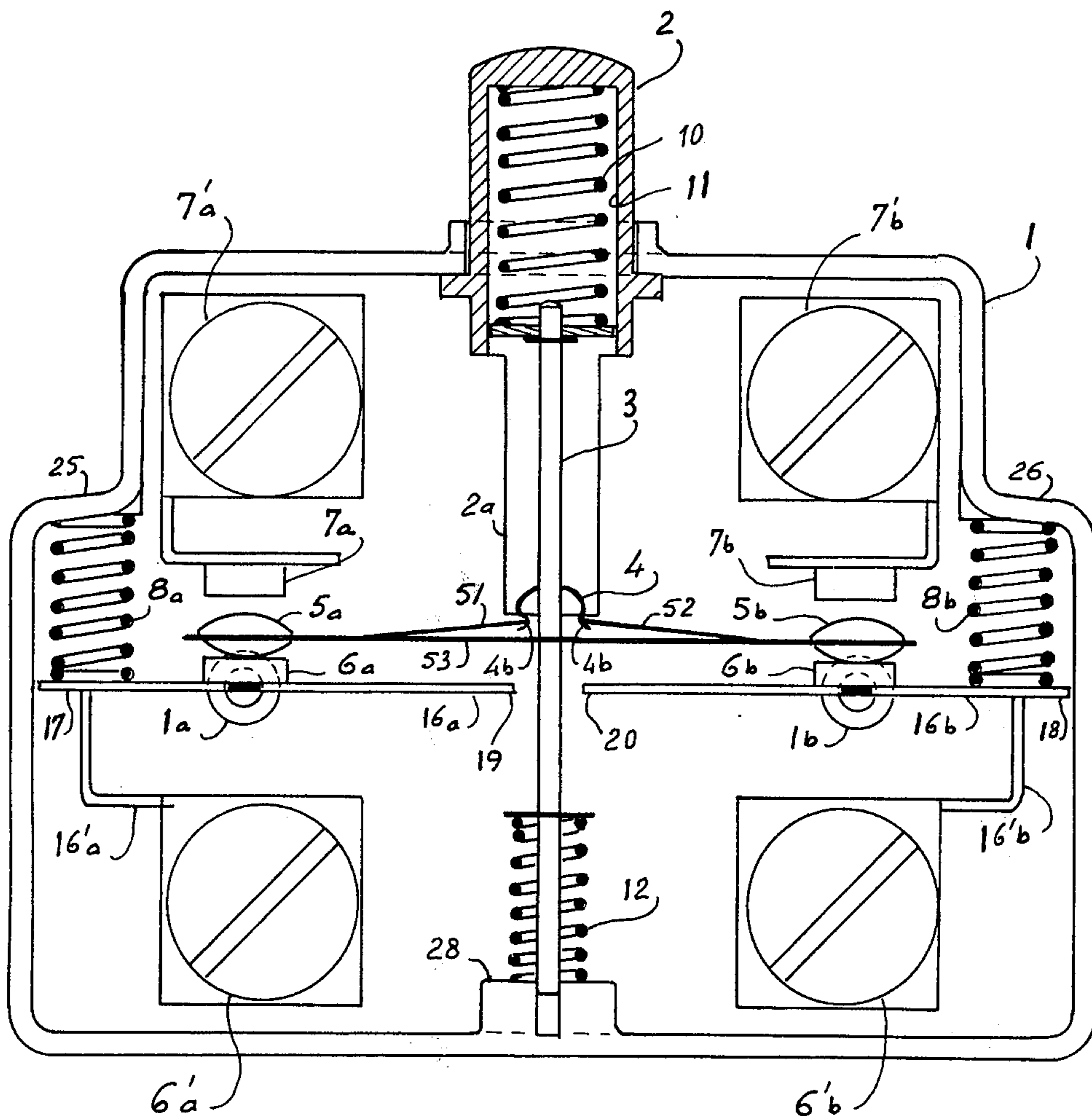
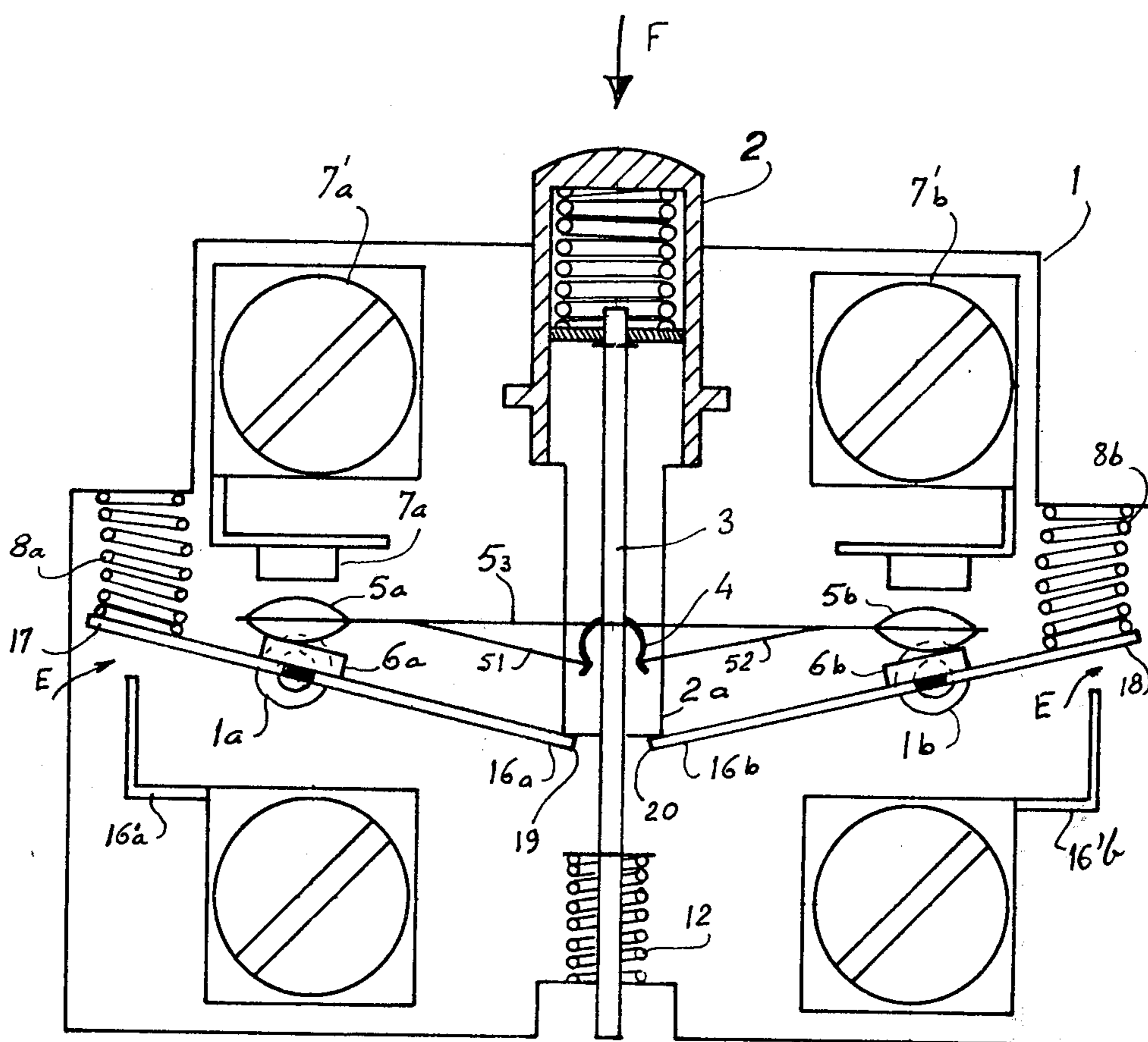




FIG. 3



## SNAP SWITCH

## BACKGROUND OF THE INVENTION

The present invention relates to a snap switch, or so-called "positive safety" switch, wherein a greater pressure on the control button of the switch necessarily switches off the electric circuit.

The invention relates more particularly to a snap switch, comprising a control button, a control rod slidable with the control button via a spring, two pairs of contacts associated, respectively, with two pairs of terminals, the two contacts of each pair of contacts being connectable by resilient conducting means under the action of a setting spring fixed to the control rod and to these means, the two contacts of one pair of contacts being able to be electrically disconnected from their respective terminals by the control button when it is pushed in completely against the action of the spring of the control rod.

Such a switch is described, as a whole, in German Pat. No. 2 551 873 (FIG. 1), German Pat. No. 2 551 858 (FIG. 1) and in British Pat. No. 1 114 630 (FIGS. 1 and 2).

However, although these latter switches enable the electric circuit to be switched off when the main contacts are welded, they present the drawback of not necessarily being able to return these main contacts into working order, in the case of these latter adhering only by microwelds further to an electric arc.

## SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a switch of the above type, in which possible microwelds may be broken.

To this end, the present invention relates to a switch of the above mentioned type wherein the two contacts of one pair of contacts are borne, respectively, by two conducting plates mounted to pivot in the switch under the action of the control button and against the action of resilient biasing means tending to connect electrically the said two contacts to their respective terminals.

Due to the arrangement of the invention, the contacts may be driven in a movement of rotation and roll on one another, this resulting in the desired breaking of the possible microwelds.

The invention will be more readily understood on reading the following description with reference to the accompanying drawing.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic view in section of the switch according to the invention, in rest position;

FIG. 2 is a schematic view in section of the switch of FIG. 1, after normal reversal of the contacts, and

FIG. 3 is a schematic view in section of the switch of FIGS. 1 and 2, in positive safety position.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, the switch according to the invention comprises a box 1 made of insulating material, in which are assembled, in known manner, a control button 2, a control rod 3 slidable with the button 2 via a spring 10, housed in a recess 11 made in the button 2. A setting spring 4, connected to the rod 3, is fixed, by its two ends 4a and 4b, to resilient conducting means formed by two portions 51, 52 of elastic plate

which are themselves fixed, in known manner, to an electrical connection conducting frame 53. This frame 53 bears two electrical contacts 5a and 5b. A downward action on the button 2 in the direction of arrow F of FIG. 2 causes the rod 3 to move in translation, and the spring 4 causes the portions of resilient plate 51 and 52 to be thrown on the other side of the frame 53 which, by the elasticity of these portions of resilient plate, is biased upwardly, i.e. towards the contacts 7a and 7b.

The box 1 comprises a pair of normally open contacts 7a, 7b and a pair of normally closed contacts 6a, 6b, associated respectively with two pairs of terminals 7'a, 7'b and 6'a, 6'b, the pair of contacts 6a and 6b being the more remote from the control button 2.

According to the action exerted in the direction of arrow F (FIGS. 2 and 3) on the control button 2, against the action of a biasing spring 12, in abutment against a boss 28 of the box 1, and consequently according to the stroke in the box 1 of the control rod 3 slidable with the button 2, the contacts 5a and 5b, via the setting spring 4, the portions of resilient plate 51 and 52, and the frame 53, may be pressed, in a first position, on the contacts 6a and 6b (FIG. 1) and, in a second position, on contacts 7a and 7b (FIG. 2).

In the first position defined hereinabove, the two contacts 6a and 6b are connected by the conducting frame 53 and the contacts 5a and 5b, and, in the second position, the contacts 7a and 7b are connected by the frame 53 and the contacts 5a and 5b.

The two contacts 6a and 6b of the pair of contacts more remote from the control button 2 are borne respectively by two conducting plates 16a and 16b arranged to pivot in the switch of the invention under the action of an extension 2a of the control button 2, and against the action of two biasing springs 8a and 8b tending to connect electrically the two contacts 6a and 6b to their respective terminals 6'a and 6'b via the two conducting plates 16a and 16b and two conducting elements 16'a and 16'b, as will be described hereinafter.

As shown in the Figures, the two plates 16a and 16b are pivotally mounted in cavities made in bosses 1a and 1b formed by moulding in the walls of the box 1. The contacts 6a and 6b are respectively disposed on the pivoting axes of the plates 16a and 16b, at the level of bosses 1a and 1b.

In normal position, the springs 8a and 8b, in abutment against shoulders 25 and 26 of the box 1, act on the ends 17 and 18 of the plates 16a and 16b to maintain them in abutment on the conducting elements 16'a and 16'b electrically connected to the terminals 6'a and 6'b.

If, for example due to an electric arc, the or each contact 5a and 5b remains stuck on the or each contact 6a and 6b (FIG. 3), it suffices to push the control button in completely, in the direction of arrow F, so that its extension 2a, acting on the ends 19 and 20 of the plates 16a and 16b, respectively, provokes the interruption of the electric circuit by causing the plates 16a and 16b to pivot, this having for its effect to disconnect the ends 17 and 18 of these plates from the conducting elements 16'a and 16'b, by creating gaps E (FIG. 3).

Furthermore, the contacts 6a and 6b being disposed on the pivoting axes of the plates 16a and 16b, the contacts 5a and 6a, on the one hand, and the contacts 5b and 6b, on the other hand, can roll on one another, this promoting the breaking of possible microwelds.

The switch according to the invention thus described and illustrated is particularly suitable for use in industrial automatic apparatus.

What I claim is:

1. A snap, switch, comprising a control button, a spring, a control rod slidable with the control button via said spring, first and second pairs of contacts, first and second pairs of terminals associated with said first and second pairs of contacts, respectively, resilient conducting means, a setting spring fixed to said control rod and to said resilient conducting means, the two contacts of each pair of contacts being connectable by said resilient conducting means under the action of said setting spring, the two contacts of the first pair of contacts being able to be electrically disconnected from their respective terminals by said control button when it is

pushed in completely against the action of said spring of said control rod, two conducting plates pivotally mounted in the switch, each of said conducting plates bearing one of the two contacts of the first pair of contacts and resilient means for biasing said conducting plates toward said first pair of terminals and thus connecting electrically said first pair of contacts to first pair of terminals, whereby said conducting plates can be pivoted under the action of said control button and against the action of said resilient biasing means for electrically disconnecting said first pair contacts from their respective terminals.

2. A switch as claimed in claim 1, wherein said two contacts of the first pair of contacts are each disposed on the pivoting axis of said pivotable conducting plates.

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